



**RESEARCH TEAM**

**Report to the**

**Nonstandard AND**

**FOREIGN MUNITIONS**

**WORK GROUP**

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## EXECUTIVE SUMMARY

**A. Background:** Following a fatal accident involving foreign ammunition, LTG Pillsbury, U.S. Army Executive Director for Explosives Safety, directed BG Wyche, Commander, Joint Munitions Command, to initiate a study to identify what corrective actions need to be taken. A Work Group was established consisting of key personnel from nearly 30 different Army organizations that are connected to nonstandard ammunition. The Work Group established a Research Team to assess the scope of the issues involved. The Research Team conducted a fact-finding mission to enlighten the larger Work Group of current conditions. This report to the larger Work Group is the result of that team's efforts.

### **B. Findings**

#### 1. General

- ✓ Nonstandard ammunition is stored and treated similar to U.S. munitions but does not have the same technical data, lot history and surveillance as U.S. munitions
- ✓ Various facilities contain significant stockpiles of foreign/nonstandard munitions. The safety and suitability of many of these stockpiles for long-term storage, transportation, and handling is unknown.
- ✓ In many cases, periodic surveillance inspections are not performed on assets in storage.
- ✓ Accountability exists, but no common processes are used
- ✓ Nonstandard materiel is released for use by the depots and ASPs without any formal process
- ✓ Technical data for ammunition gathered for exploitation is very limited.
- ✓ No evaluation of the aging characteristics to determine the continuing safety to store
- ✓ Multiple storage, access, safety, and transportation processes at different installations (no standard processes)
- ✓ No cross-referencing and little cataloging of technical data that has been gathered over the years.
- ✓ No single entity identified & funded to take needed actions
- ✓ Disposal of nonstandard materiel is complicated by unknown materials that may have environmental impact

#### 2. Intelligence Community:

- ✓ Exploitation is inherently dangerous because we are dealing with unknown materiel and conditions
- ✓ Interim Hazard Classifications issued without all required information
- ✓ Exploitation material is stored as if it were U.S. materiel but does not share the controls applied to U.S. materiel
- ✓ Some items gathered in quantity during the intelligence process have been released for use.
- ✓ No process to validate that exploitation samples are safe for transportation, handling and storage
- ✓ No source of funds to make safe the exploitation process
- ✓ Results of exploitation process kept locally; little information is shared

3. Test and Evaluation Community:

- ✓ Test Directors may believe nonstandard ammunition issued by the Ammunition Supply Point (ASP) has been assessed as safe and serviceable
- ✓ Nonstandard ammunition is often not inspected because there is no criteria available
- ✓ There are significant quantities of excess materiel being stored with few of the controls applied to U.S. materiel
- ✓ There are no standards set to determine when nonstandard materiel should be demilitarized

4. Special Operations Community:

- ✓ U.S. Special Operations Command (USSOCOM) sets their own standards for their Systems Safety
- ✓ Nonstandard ammunition cannot be given the same level of surveillance as U.S. materiel due to lack of technical data and inability to conduct periodic reliability tests
- ✓ Nonstandard ammunition does not undergo Army Systems Safety Assessments and Health Hazard Analysis, or have Surface Danger Zones
- ✓ Reporting of malfunctions of nonstandard ammunition is not as extensive as for U.S.
- ✓ Processes employed at ASPs and depots for release of nonstandard ammunition are not as thorough as for U.S.

**C. Actions identified for the Work Group to address:**

- ✓ Develop a common accounting and numbering system for ALL organizations to employ for nonstandard ammunition
- ✓ Conduct an Army-wide inventory of the nonstandard materiel in storage
- ✓ Conduct a detailed hazard analysis of National Ground Intelligence Center (NGIC) exploitation efforts and use of Interim Hazard Classes (IHC)
- ✓ Consider establishing and funding a single entity to be responsible for tracking and managing nonstandard ammunition throughout its lifecycle
- ✓ Find a means to perform safety assessments for nonstandard materiel
- ✓ Find a means to create a suspension system for nonstandard materiel
- ✓ Consider establishing standards for inspecting and testing nonstandard materiel in storage
- ✓ Consider establishing standards for the retention of nonstandard materiel and establishing storage shelf lives
- ✓ Consider establishing new, separate condition codes for nonstandard materiel to alert users to increased risk (requires DOD-level action)
- ✓ Consider restrictions the Army should adopt for employing nonstandard munitions beyond those already being applied
- ✓ Establish a process for depots & ASPs to employ before releasing materiel
- ✓ Ensure uninterrupted support to U.S. Army Special Operations Command combat operations

## I. INTRODUCTION

- A.** On 21 May 2009, a test being conducted at Aberdeen Proving Ground (APG) employed foreign (Soviet Union) 100mm anti-tank projectiles. The test was conducted using a T-55 tank with a crew of three. As part of the safety procedures, the fuzes assembled to these rounds were rendered inert by removing the explosives content of the fuzes; the explosives content of the projectiles was left intact. During the firing, one of these rounds exploded before exiting the gun tube. The two personnel who were loading and firing the gun were killed and the tank driver was severely injured.
- B.** Action was taken at the time to suspend the use of foreign munitions that used the same type of fuze that was involved in the incident. However, there was no administrative mechanism within the Army to initiate such a suspension or even to identify where such munitions might be stored. In addition, the initial investigation identified that there are no standard procedures in place for all organizations working with nonstandard and foreign munitions. As an expedient, the Joint Munitions Command (JMC) communicated the suspension in the same manner that they use for U.S. munitions.
- C.** As a result of the preliminary findings of the investigation, LTG Pillsbury, Deputy Commander of the Army Materiel Command (AMC) and also the Army's Executive Director for Explosives Safety (EDES) directed BG Wyche, Commander of JMC to initiate a study to identify what corrective actions need to be taken. A Work Group was established consisting of key personnel from nearly 30 different Army organizations that are connected to nonstandard ammunition. The Work Group was tasked to assess safety standards for nonstandard and foreign munitions retained in U.S. storage and test facilities, and identify challenges facing the special operations, test, research, development, and intelligence communities who deal with these items. Recommendations from the working group will be coordinated with the AMC and the Joint Munitions & Lethality Life Cycle Management Command (JM&L LCMC).
- D.** In order to understand the scope of the project, it was deemed necessary to assemble a Research Team that could assess existing safety standards, processes, and procedures used by the various organizations in handling and storing nonstandard and foreign ammunition. The scope of the Research Team was to collect information on how organizations handle nonstandard/foreign ammo and the types of activities for which it is used; to identify logistical and safety procedures being employed; to determine safety information and assessments available during procurement or at the time of gaining possession; to identify storage, condition, accountability, maintenance, and disposal processes; to ascertain existing coordination points and explosive safety measures; and to determine how safety information is currently shared. The Research Team was tasked to analyze the information gathered, identify best practices being employed, and make recommendations with an eye toward improving communications and standardizing processes among the stakeholders. In essence, the Research Team conducted a fact-finding mission to enlighten the larger Work Group of current conditions. This report to the larger Work Group is the result of that team's effort.

## **II. MISSION AND METHODS OF BASES AND ACTIVITIES VISITED**

### **A. Background**

1. The team visited six Army bases and interviewed various activities associated with nonstandard or foreign ammunition at these sites. The bases included APG, Blue Grass Munitions Center (BGMC), Picatinny Arsenal, Letterkenny Munitions Center (LEMC), Fort Bragg, and Redstone Arsenal. These do not represent the whole of Army bases storing or handling these materials, but were considered to house the agencies most involved in associated activities, and were thought to be a sufficient sample to represent the Army spectrum of nonstandard/foreign materials, missions, and processes. The number of agencies and quantities of these materials was more extensive than the team originally expected. Activities involving these materials range from basic storage, to procurement, and testing/analysis.
2. The Army uses Standard Army Ammunition System (SAAS) and Standard Depot System (SDS) to maintain accountability of ammunition. Both automated systems provide centralized information management to support receipt, storage, and issue operations at Army retail and depot organizations. Ammunition is typically identified by a combination of National Stock Number (NSN), Department of Defense Identification Code (DODIC), nomenclature, and lot number. Together, these systems provide worldwide ammunition stockpile visibility information that allows managers to view assets in a number of ways, to include location, condition code, lot number, and ownership codes.
3. Activities with nonstandard/foreign ammunition assets have unique mission requirements that include research and development, intelligence exploitation, foreign weapons training, Explosives Ordnance Disposal (EOD) technology, and overseas contingency operations. Based on characteristics unique to the mission and ammunition, accounting and identification requirements vary greatly between organizations. The installations that the Research Team reviewed all maintain a closed loop automated accountability system, and asset reporting is accomplished informally through electronic mail and phone conversations. Although the reporting and tracking procedures are different among activities, each installation categorizes nonstandard/foreign ammunition items to reflect properly the stock status and disposition; and to maintain accountability.
4. The Research Team recognizes the distinct characteristics of effectively managing nonstandard/foreign ammunition. The systems and practices in place are intended to ensure safety, security, and accountability. However, with the lack of centralized management for these assets, specific guidance relative to method of safety and accountability is missing. The following paragraphs describe the types and levels of nonstandard/foreign ammunition efforts and the accounting, identification, and reporting practices of installations visited.

### **B. Blue Grass Munitions Center (BGMC) Richmond, Kentucky:**

1. BGMC is primarily involved in storage and inventory management. No testing or procurement is performed here. BGMC provides nonstandard/foreign ammunition support to Special Operations Forces (SOF), serving as the sole source resupply point for overseas contingency operations. It is the primary storage depot for SOF unique items, managing 17 local

ammunition accounts. In 2009, SOF shipments totaled 1,560 short tons; 341 total shipments. Requirements are expected to increase in each of the next 5 years. Foreign ammunition purchases are accomplished at other agencies, with delivery to and storage at BGMC. In addition, BGMC reported that some nonstandard/foreign ammunition shipments associated with foreign military sales are made to BGMC for temporary storage. In general, the storage of the nonstandard/foreign items at BGMC is dynamic, and long-term storage is not the intent of their mission.

2. Ammunition accountability is maintained on SDS.

#### **C. Letterkenny Munitions Center (LEMC), Chambersburg, Pennsylvania:**

1. LEMC provides storage and labor support for the National Ground Intelligence Center (NGIC) nonstandard/foreign ammunition mission. An Inter-Service Support Agreement (ISSA) is in place and defines the mission scope and requirements. The majority of nonstandard/foreign ammunition at LEMC belongs to NGIC (approximately 30 earth-covered magazines). LEMC provides some foreign ammunition storage for other agencies (e.g., Missile and Space Intelligence Center (MSIC), and Air Force). LEMC supports initial receipt inspections at their foreign ammunition workshop. Minor maintenance (marking, preservation and packaging) is also done at the workshop. Inspections are performed with participation of subject matter experts from the associated agencies. LEMC does provide long-term storage for some NGIC controlled items, and referenced one 1940s vintage foreign ammunition as an example.

2. Ammunition accountability is maintained on SDS and munitions are identified by Foreign Ordnance Material (FOM) number. LEMC can obtain a Management Control Number (MCN) for items received without an identification number.

#### **D. Fort Bragg**

1. Involvement of Fort Bragg in nonstandard/foreign munitions is associated with U.S. Special Operations Command (USSOCOM) needs. The team visited the Ft. Bragg Armament Facility, which provides foreign weapon training to SOF soldiers. This organization performs function tests (not Safety Certifications) on small/medium caliber weapons and rocket propelled grenade (RPG) launchers. Procurement of foreign/nonstandard ammunition for SOF weapons testing and training is performed at USSOCOM Headquarters in MacDill AFB, Tampa Florida in conjunction with the USSOCOM cell at Armament Research Development & Engineering Center (ARDEC). To meet mission needs, USSOCOM uses Title 10 Acquisition Authority to procure foreign items directly. USSOCOM may elect to use Product Director, Nonstandard Ammunition (PD-NSA) for some future ammunition purchases.

2. SOF Armament maintains approximately three months supply of nonstandard/foreign ammunition. Ammunition is called-forward from BGMC and stored at the Ammunition Supply Point (ASP) until needed. The database that tracks this ammunition is maintained at Blue Grass. Approximately three months supply is stored in a licensed arms room at the Ft. Bragg Armament Facility. Any discrepancies or malfunctions are reported directly to BGMC and the ARDEC USSOCOM Cell.

**E. Picatinny Arsenal, Dover, NJ:** Nonstandard/foreign ammunition activities at Picatinny Arsenal, APG, and Redstone Arsenal range across the spectrum of storage, procurement, analysis, and test. At Picatinny, the team visited the ARDEC USSOCOM Cell, ARDEC EOD Technology Directorate, ARDEC Foreign Intelligence Office (FIO), ARDEC ASP, ARDEC Risk Management Office, and the PD-NSA.

### 1. The ARDEC USSOCOM CELL

(a) This cell is the central procurement point for SOF foreign/nonstandard ammunition requirements. Small arms ammunition (SAA) and RPGs comprise the bulk of the USSOCOM Cell's foreign ammunition purchases. When practical, the USSOCOM Cell may use PD-NSA contracts to purchase foreign ammunition.

(b) Ammunition procured and managed by the ARDEC USSOCOM Cell is stored at BGMC. Inventory accounting and centralized asset identification and visibility are maintained on an Excel database. The database tracks all receipt and issue disposition instructions. ARDEC USSOCOM Cell notifies BGMC to release ammunition for specific uses and, once in the component ammunition account, visibility of these assets is maintained by the unit. The unit Training Munitions Supervisor (TMS) then controls its dispersal and use.

### 2. Program Executive Office for Ammunition (PEO Ammo), Product Director for Nonstandard Ammunition (PD-NSA).

(a) In April 2008, a Task Force was established by the JM&L LCMC CG in response to a congressional inquiry into illegal activities by a US company under contract by the Army Sustainment Command (ASC) to provide nonstandard ammunition to Afghan Army and Police Forces. Personnel on the Task Force from PEO Ammo and ARDEC were later chartered as a Product Director office under the Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA(AL&T)) policy with the mission to procure nonstandard ammunition for the US Army in coordination with other services (Ref. 2). The PD NSA currently procures NSA for foreign governments with requirements submitted through the JMC Security Assistance office as well as other services using program, technical and quality management processes as similar to US standards as possible without owning the entire technical data package.

(b) The majority of nonstandard ammunition procurements executed by the PD NSA office are for foreign governments that utilize either their internal accounting and reporting system or one developed with the assistance of the US military. The Foreign Military Sales (FMS) program provides for formal supply discrepancy reports (SDR). These are received by the JMC for all FMS ammunition. However, US personnel have found implementing formal reporting procedures at the user level to be difficult at best. Other organizations or services receiving nonstandard ammunition through the PD NSA office maintain their respective accounting and reporting procedures. Technical data and lot history files are stored in a database maintained by the PD NSA office for use in the event of an issue with the items provided.

### 3. The ARDEC EOD Technology Directorate

(a) This group supports the NGIC foreign ammunition exploitation mission. In addition, this office renders-safe foreign ammunition for EOD training purposes and publishes technical data

in the EOD ‘60 series’ manuals. The ammunition is obtained through a variety of sources, to include battlefield pickups and new procurement purchases. EOD maintains its own storage bunkers but long-term storage is not supported.

(b) Ammunition accountability is maintained on Systems Applications and Products (SAP) software, in coordination with the ARDEC ASP. Ammunition is disassembled and a formal report provided to NGIC. EOD Technology maintains communication with EOD units and users of foreign ammunition worldwide and reports problems/concerns accordingly. No formal reporting system is in place.

#### 4. The ARDEC Foreign Intelligence Office (FIO)

(a) This office is the manager for foreign ammunition exploitation. FIO is notified by NGIC when an item of ammunition is available for exploitation. Requests for foreign ammunition assets used in exploitation tests are approved by ARDEC (FIO), and NGIC fills the request. Exploitation seeks to determine how a foreign ammunition item functions and to find a means to render-safe the item should that be necessary in the future. A “Foreign Material Test Report” is generated for each exploitation item and provided to NGIC.

(b) The Defense Intelligence Agency (DIA) maintains a secret database that collects specific lot identification information of foreign manufacturers. Ammunition received for exploitation purposes is identified by a FOM number. FOM numbers are assigned by NGIC.

#### 5. Picatinny Ammunition Supply Point (ASP)

(a) All foreign and nonstandard ammunition used for exploitation, test, or research and development at ARDEC is received and stored at the ASP. The ARDEC EOD Technology Directorate maintains control of their own storage bunkers but the ASP has visibility of all ammunition assets on hand. At the time of our visit, the ASP had visibility of 151 lines of foreign items.

(b) Ammunition is accounted for on the SAP database and is assigned an MCN for identification purposes. Army Test and Evaluation Command (ATEC), assigns the MCN. The SAP database is regularly reviewed by ASP management for excess/old/obsolete stocks. Assets on hand for two or more years require written justification from the account owner for continued storage. It was noted that regardless of whether an item was received with a FOM number, a new MCN is established for all future accounting and tracking.

6. The ARDEC Risk Management Office was established specifically to address test safety. The test center will not do any firing without a Safety Assessment Report (SAR). Every test Standard Operating Procedure (SOP) is reviewed and must have Senior Executive Service (SES) approval. ARDEC sometimes buys nonstandard/foreign materials to consider their use for U.S. Many of these items must be kept indefinitely but they are not approved for use by U.S. soldiers. ARDEC does a wide range of tests, to include pyrotechnics, SAA mortar, artillery, tank, fuzing systems, aircraft counter-measures, blasting caps and demo charges.

**F. Aberdeen Proving Ground (APG), Aberdeen, MD.** At APG, the team visited with personnel from ATEC, Garrison APG (GAPG), NGIC, Army Research Lab (ARL), and

Aberdeen Test Center (ATC). ATEC uses nonstandard/foreign ammunition in developmental testing, operational testing, evaluations, assessments, and experiments. Nonstandard ammunition includes test unique, experimental, prototype, and commercial.

1. Garrison Aberdeen Proving Ground (GAPG)

(a) Nonstandard/foreign ammunition receipts are delivered to the GAPG ASP. GAPG requires customers acquire a control number prior to procurement of ammunition. The control number worksheet that is filled out provides ASP management with information that is used in storage planning decisions. Minimal technical information is available on most purchases and comparison to similar items is used for storage and handling classification.

(b) GAPG uses a modified version of SDS for stock record accounting purposes. Catalog data is built into SDS based on the technical information provided. When an item arrives with little or no information, catalog information is derived from comparison of similar items. MCNs, FOM numbers and PSEUDO DODICs are used to identify nonstandard/foreign ammunition. If the ammunition is received with an established FOM number, then that number will serve as the item number of record. GAPG requires customers to acquire a control number prior to procurement of ammunition. A worksheet is filled out that provides ASP management information that is used in storage planning and life cycle management decisions.

2. National Ground Intelligence Center (NGIC).

(a) NGIC serves as a ‘mini-depot’ for foreign ammunition brought in for intelligence exploitation. Ammunition received for exploitation is obtained from a variety of sources to include government-to-government contracts and battlefield pickups. A wide variety of conventional munitions are coordinated through and stored by NGIC, to include Improvised Explosive Devices (IED). In some cases, the items do not go through NGIC, but go directly to the requesting agency. The team was provided examples of “Materiel Release Orders,” (Ref. 4) wherein munitions were authorized by NGIC for release to user installations (e.g., Camp Pendleton). NGIC has a workshop to support initial receipt inspections and minor maintenance capability (marking, preservation and packaging) but not testing.

(b) NGIC’s mission includes support of IED exploitation efforts. NGIC uses the Foreign Material Management System (FORMMS) to account for munitions from time of receipt until disposal. A FOM number is established in FORMMS for identification purposes. Technical information on the ammunition received for exploitation is maintained on the “SPIRT” and “HARMONY” database. Asset visibility outside of NGIC does not exist, and the sharing of information between intelligence organizations is limited. NGIC will release ammunition to user installations (e.g. Camp Pendleton) on Material Release Orders (MRO).

3. Aberdeen Test Center (ATC).

(a) Testing is performed by ATC in support of NGIC. ATC receipts from the ASP are kept to a minimum, and their stockpile is routinely reviewed for excess. A recent turn-in of 267 lines of foreign/nonstandard ammunition was accomplished. It is ATC policy to remotely fire whenever possible, and ammunition is always visually inspected for defects (sometimes X-

Rayed) prior to any live test. ATC participates in the work group meetings that perform risk assessment and hazard analysis for specific tests.

(b) ATC performs a variety of live fire tests on behalf of customer activities located on APG. ATC uses an internally developed ACCESS database to account for ammunition, received from customers and the ASP. Items are managed by FOM, MCNs, PSEUDO DODICs, and part numbers. Storage is kept to a minimum and the stockpile is routinely reviewed for excess/obsolete stocks.

4. U.S. Army Research Laboratory Sites (ARL).

(a) ARL maintains 24 storage magazines and operates approximately 60 testing sites on APG. Foreign and nonstandard ammunition accounts for approximately 85% of the stocks on hand. ARL supports testing a wide variety of conventional and IED exploitation.

(b) ARL conducts compatibility and sensitivity tests on unknown munitions, to include IED exploitation for various customers. All ammunition at ARL is accounted for on Defense Property Accountability System (DPAS), and, depending on the source and the manner that the items were received, munitions are identified by FOM, MCN, PSEUDO DODIC, or part number. ARL will also create internal MCNs for ammunition that has been altered during testing.

5. U.S. Army Test and Evaluation Command (ATEC). ATEC assigns MCNs to items at time of receipt or after modification. There is no standard database in use at the test centers (ATC, Redstone Technical Test Center (RTTC), Yuma Proving Ground, White Sands Missile Range (WSMR), Dugway Proving Ground) and thus, ATEC has limited visibility of nonstandard and foreign ammunition assets in the system. Stock record accounting systems in place include SDS, Aviation and Missile Command Ammunition Tracking System (AMCATS), and other local databases. Nonstandard ammunition is identified and managed by any combination of MCN, PSEUDO DODIC, FOM, or part number.

**G. Redstone Arsenal, Huntsville, AL.** At Redstone Arsenal, the team visited with personnel from PEO Missiles and Space, AMC, Aviation and Missile Command (AMCOM) Safety, AMCOM Garrison ASP, Aviation and Missile Research Development and Engineering Center (AMRDEC), RTTC, and MSIC. Ammunition office personnel and Quality Assurance Specialists (Ammunition Surveillance) (QASAS) from both PEO Missiles and Space, and AMC provided good insight to the types of nonstandard missions that occur within the arsenal. They informed the Research Team that nonstandard items have been generated by research and test. For example, missiles may be modified for upgrade or for testing a concept and nonstandard residue may be generated, or the concept prototypes may not all be fired and will remain in storage with no disposition. There are as many as 54 magazines of excess nonstandard materiel at Redstone.

1. The AMCOM Safety Office has limited involvement with nonstandard/foreign ammunition issues. They review RTTC SOPs, and support Risk and Hazard Analysis reviews, but no longer review those documents for other tenant organizations (AMRDEC, MSIC, Federal Bureau of Investigation (FBI), or Alcohol, Tobacco, and Firearms (ATF)).

2. U.S. Army Aviation and Missile Command (AMCOM), Garrison ASP.

(a) Surveillance and inventory management personnel at the garrison ASP explained that magazines at Redstone are owned and controlled by many different organizations. Customers include RTTC, AMRDEC, National Aeronautics and Space Administration (NASA), MSIC and U.S. Army Ordnance Munitions and Electronics Management School (OMEMS). The only support the garrison ASP personnel provide to the other agencies are annual magazine inspections. However, significant quantities of nonstandard and foreign ammunition/parts/components have been turned in from the other agencies to the garrison for storage in ASP magazines. The garrison has limited demilitarization capability, and has difficulty getting disposition instructions for these items. Efforts are underway to identify and demilitarize excess. The team visited several ASP magazines and observed the storage of numerous components (e.g., rocket motors, fuzes, etc.), and foreign munitions. Some of the foreign items observed have been stored at the ASP for a long period and the garrison does not know what agency is responsible for them.

(b) Nonstandard and foreign ammunition/parts/components are held at the ASP in support of various research and development projects. Approximately two years ago, the stock record accounting systems transitioned from AMCATS to SAAS-MOD. AMCATS was developed for Research and Development (R&D) purposes, and the system takes into consideration the need for component tracking once the munitions are modified. We were told that WSMR still uses AMCATS, along with other AMCOM tenant activities to account for ammunition. Ammunition/parts/ components are identified by a combination of FOM, MCN, and Commercial and Government Entity (CAGE) /part number. Efforts are underway at the ASP to identify a considerable amount of nonstandard and foreign ammunition that has been held in storage for several years. When SAAS-MOD replaced AMCATS, the ownership codes fell from record. In an attempt to reduce excesses, the ASP is requesting tenant activities to identify their energetic items and provide disposition instructions.

### 3. Aviation and Missile Research Development and Engineering Center (AMRDEC).

(a) The AMRDEC Weapons Development and Integration Directorate (WDI) performs ammunition exploitation services primarily for MSIC and NGIC. AMRDEC WDI controls twenty bunkers and long-term storage is discouraged. They currently maintain 25 lines of foreign ammunition items, and have a variety of nonstandard squibs, detonators, etc for use in tests. They have not been involved with IED testing. All WDI disassembly and live firings are done remotely.

(b) AMRDEC controls 20 storage bunkers and maintains stock at the Garrison ASP. Ammunition is accounted for on AMCATS and identified by “Mobile Ordnance Disrupter” (MOD) number. MCN and FOM numbers are also used. Technical and catalog information is entered in AMCATS

### 4. Redstone Technical Test Center (RTTC)

(a) RTTC maintains approximately 60 magazines. Many nonstandard items are generated from test items disassembled but not tested. Additionally, RTTC utilizes foreign small arms, RPGs, and IEDs for threat assessment and active protection system tests. These items are obtained through NGIC. The foreign items are always fired remotely.

(b) RTTC performs R&D tests for customer and tenant activities at Redstone. In support of the “Active Protection System Testing Program,” RTTC maintains stocks of SAA and rocket propelled grenades (RPG). RTTC controls 60 storage magazines and accounts for ammunition stocks on AMCATS. FOM numbers are typically used to identify energetic stocks. Interim Hazard Class (IHC) information is used to build the catalog information into AMCATS.

## 5. Missile and Space Intelligence Center (MSIC)

(a) MSIC is not an Army agency, but is a tenant on Redstone Arsenal and stores their class V items in 22 of Redstone Arsenal’s magazines. MSIC collects foreign munitions for the purpose of intelligence exploitation. Ammunition is obtained through various means to include battlefield collections and formal acquisitions. Hazardous Materiel Transportation Office (HMTO) is utilized to bring foreign ammunition to MSIC. MSIC deploys EOD technicians to assist in these efforts. Items are brought directly to Redstone by military air. MSIC writes the SOPs but generally utilizes personnel and facilities from RTTC or other test agencies (e.g., WSMR) for the conduct of tests or disassembly.

(b) MSIC collects foreign ammunition for the purpose of intelligence exploitation. Exploitation seeks to determine the characteristics and performance of a foreign weapon system. EOD technicians and MSIC personnel are capable of exploiting every missile system in the mission area. MSIC controls 22 storage magazines and ammunition is accounted for on an ACCESS database. The database is set up to track ammunition and component parts through the exploitation process, using a “Foreign Identification Designator” (FID) number

**H. Accounting and Reporting Conclusions:** Significant activities have occurred during the past year to promote a goal of new account management techniques and centralized asset identification and visibility. The Army’s nonstandard/foreign ammunition stockpile is loosely managed, without regards to many of the formal accounting and reporting procedures in place for the life-cycle management of standard ammunition. As a result, systems do not communicate, centralized databases do not exist, asset identification is often incorrect and vital safety and suspension information is not formally disseminated throughout the user communities. Records of what has been expended are also not being kept or reconciled. The table below shows the major activities with a nonstandard/foreign ammunition mission, and the automated means to account for and identify their assets. Eight different stock record accounting systems are in use, and none is linked to a central database. The characteristics of each foreign item serve as the basis for safety and suspension alerts. With subjective asset identification and lack of central management, the ability to manage effectively the risks of using/storing/modifying foreign ammunition is compromised.

ACTIVITY	FOREIGN/NON-STD AMMUNITION MISSION	ACCOUNTING SYSTEM	STOCK NUMBER IDENTIFICATION
Ft Bragg Armament Facility, Fort Bragg, NC	Special Forces Training	Local System EXCEL Database and SDS	Nomenclature, DODICs and MCN
ARDEC USSOCOM Cell, Picatinny Arsenal, NJ	SOF Foreign Ammunition and Weapon Procurement and Management	Local System EXCEL Database and SDS	Nomenclature, DODICs and MCN
PD-NSA, Picatinny Arsenal, NJ	Foreign/nonstandard Ammunition Procurement (Non-U.S.)	Local System Oracle Database	Nomenclature
ARDEC, EOD Technology, Picatinny Arsenal, NJ	NGIC Foreign Ammo Exploitation Support	SAP	FOM
ARDEC, FIO, Picatinny Arsenal, NJ	Foreign Intelligence Ammunition Exploitation		
ARDEC, ASP, Picatinny Arsenal, NJ	ARDEC Storage	SAP	MCN
ATEC, Aberdeen, Maryland	Developmental and Operational Testing	SDS, AMCATS, Local System ACCESS Database	FOM, DODIC, MCN, PSEUDO DODIC, CAGE/Part number
GAPG, Aberdeen, Maryland	Garrison Storage	SDS	FOM, PSEUDO DODIC
NGIC, Aberdeen, Maryland	Foreign Intelligence Ammunition Exploitation	FORMMS	FOM
ARL, Aberdeen, Maryland	R&D and IED Exploitation	DPAS	FOM, MCN, PSEUDO DODIC
ATC, Aberdeen, Maryland	Aberdeen Test Support Activity	ACCESS	FOM, MCN, PSEUDO DODIC
BGMC, Richmond, Kentucky	SOF Foreign Ammunition Storage	SDS	MCN
LEMC, Chambersburg, PA	NGIC Foreign Ammo Storage	SDS	FOM, MCN
AMCOM, Garrison ASP, Redstone, Alabama	AMCOM Garrison Storage	SAAS-MOD	FOM, MCN, Part Number
AMRDEC, Redstone, Alabama	MSIC Foreign Ammunition Exploitation Support	AMCATS	MOD
RTTC, Redstone, Alabama	Research and Development	AMCATS	FOM
MSIC, Redstone, Alabama	Foreign Intelligence Ammunition Exploitation	ACCESS	FID

### **III. WRITTEN OPERATING PROCEDURES AND REPORTING**

**A. Background.** Standing Operating Procedures (SOP) are required for all hazardous operations. They provide personnel the level of detail necessary to execute the operation in a safe, efficient manner. Written standards (work plans, instructions, operating manuals, etc.) may be substituted for SOPs when they provide this same level of detail. The SOP and operating instructions at installations visited are identified below.

#### **B. Operating Procedures**

1. Fort Bragg Armament Facility. The written operating instructions in place focus on weapons training rather than the ammunition aspects. Ft Bragg Armament Facility reported no instances of malfunctions involving foreign ammunition, but in the event that a malfunction occurs, they indicate BGMC and the ARDEC USSOCOM Cell would be notified.

2. ARDEC, EOD Technology. Disassembly plans are reviewed and approved prior to the start of any breakdown operation. When ammunition is disassembled for exploitation purposes, a formal report of findings is provided to NGIC. EOD Technology maintains communication with EOD units and users of foreign ammunition worldwide and reports problems/concerns accordingly. No formal reporting system is in place.

3. ARDEC, FIO. Prior to any breakdown for exploitation, a disassembly plan is drafted, reviewed for safety, and approved. Generally, little is known of ammunition acquired through battlefield collections, and technical data is not available. Man firing of foreign ammunition from an unknown source is never authorized. When technicians discover a condition that may be cause for concern, a “spot report” (identifying dangers) is drafted and disseminated throughout the EOD community.

4. ARDEC, Risk Management. The Risk Management office at ARDEC requires a hazard analysis and risk assessment for every test/operation involving energetic materials. Man firing of foreign ammunition is seldom approved.

5. U.S. Army Test and Evaluation Command (ATEC). The Test Manager/Officer is responsible for obtaining a detailed test plan and safety documentation that includes a SAR, prior to any testing. A Safety Release may be generated following developmental testing and used to determine item readiness for operational testing. A Safety Confirmation may be generated following developmental testing and used to determine item readiness for a major milestone review (i.e., Type Classification or Materiel Release). Critical test safety program components include SOPs, trained and qualified personnel, hazard identification and analysis, risk mitigation/control and acceptance.

6. U.S. Army Research Laboratory (ARL). Prior to any testing, a comprehensive test plan is drafted. Work group meetings are held to discuss specifics and mitigate risks. No testing is conducted until the test plan is approved and a hazard analysis performed. As indicated in a 12 June 2009 memorandum, Subject: Static Detonation and Remote Firing of Foreign Ordnance Munitions (FOM), “all firing of FOM will be conducted remotely with personnel located in an approved bombproof” (Ref.5). If uncertainties exist concerning safety/stability of the round, the test is canceled and the item turned over for disposition or destruction.

7. Aberdeen Test Center (ATC). ATC participates in work group meetings that perform risk assessments and hazard analysis for specific tests. Range Control will not approve a range request unless an approved hazard analysis is provided. ATC indicates that assumptions are made concerning the safety of nonstandard/foreign ammunition. Ammunition is received from the ASP in a serviceable condition code “D.” It is assumed that because the ASP issued the ammunition, it has been inspected and is safe to use. In fact, minimal technical history is generally available and the ASP is assuming that the test communities understand the makeup and risks associated with the ammunition.

8. Letterkenny Munitions Center (LEMC), Chambersburg, Pennsylvania. Periodic inspections of nonstandard/foreign ammunition are accomplished by comparison of like items, using criteria of SB 742-1.

9. AMRDEC. A comprehensive test plan that includes a hazard analysis/risk assessment is drafted prior to any live tests. The risk level identified in this document determines the approval authority level, necessary to go forward with the test. All live test firings are done remotely. Exploitation efforts over the years have identified design flaws in nonstandard/foreign ammunition that is a safety concern. When this is discovered, information/warnings are passed along to customers in email messages.

10. RTTC. SOPs are developed prior to any test. A Hazard Analysis Work Group (HAWG) at RTTC reviews and recommends for approval all SOPs. The technical history of most nonstandard/foreign ammunition is not known.

11. MSIC. SOPs and disassembly plans are in place prior to any exploitation breakdown. With every test/exploitation, a Foreign Material Exploitation Report (FMER) is drafted. If a dangerous design feature is identified, information is passed throughout EOD and test/intelligence community.

**C. Operating Procedures and Reporting Summary/Conclusion.** The guidance and instruction provided in the documents we reviewed seemed adequate to perform the test/exploitation missions at hand in a reasonably safe manner provided the risks from the ammunition are included in the risk analysis. Risk management components are incorporated into most processes, and through application of controls, risks and the chance of accidents are significantly reduced. The one area that all activities fail to identify accurately is the unknown characteristics of the foreign ammunition. The analytical methodology used to reduce uncertainties of testing foreign ammunition is severely compromised when gaps exist in the technical history of these rounds. Recommended controls, such as no manned firing of foreign ammunition, are not always incorporated in the test plans due to the nature of the mission.

## IV. EXPLOSIVES SAFETY

### **A. Background**

1. The most significant safety concern is the assumption on the part of users that the ammunition they have been provided has been assessed as safe and serviceable. With little technical data on this ammunition, little knowledge of its past storage environments, and insufficient quantities to conduct meaningful testing, no one has the capacity to determine with much certainty that it is, in fact, safe and serviceable.
2. ASP and Depot personnel issuing ammunition for use are unable to apply the same kind of controls that they would apply to U.S. munitions prior to issue because of the lack of information. They must assume that the users are aware of the increased risk and have controls in place to mitigate it.
3. USSOCOM tests and accesses safety data for all foreign and nonstandard ammunition that they purchase. Ammo lots are tested and tracked.
4. Due to limited available quantities of some items and the lack of technical data available, very little testing is done for some items. Test centers asked to evaluate risks will classify use of the item as “high risk” without being able to specify what those risks are due to the lack of data. USSOCOM and other users would like to have information that is more specific to help them assess the real risks involved.

### **B. Systems Safety and Safety Assessments**

1. In a U.S. R&D munitions program, a System Safety Working Group led by a System Safety Engineer conducts a comprehensive System Safety assessment based on review of technical data and design descriptions, Hazard Classification, safety testing, hazard analyses, and compliance assessments to safety design and testing standards. Such a comprehensive System Safety assessment is not usually possible for foreign/nonstandard munitions due to limited data availability.
2. Comprehensive Munitions Safety Assessments include:
  - (a) Adherence to requirements for proper assignment Interim Hazard Classifications (TB 700-2; Title 49, CFR, Part 173; and UN Manual of Tests and Criteria, Part I, Section 13 and Section 14) to ensure that energetic materials are not too dangerous for transportation. Explosives are unsuitable for transportation if they are not properly classified by procedures in 173.56, 49 CFR, or present unacceptable hazards as specified in 173.21, 49 CFR. Many forbidden explosives are listed in Table 172.101 of 49 CFR.
  - (b) Evaluation of the thermal stability of munitions to elevated thermal conditions to determine if it is too hazardous for transport.
  - (c) Evaluation of explosive compositions and the sensitivity and stability data available to determine if they are safe for transport.
  - (d) Reviews of the physical and functional description of the munitions, fuze and fuze safety features (if applicable). Consider the susceptibility of the munitions and its safety features to environmental stimuli (drop, rough handling, vibration, temperature, etc.). Assess compliance to

safety design and test standards (e.g. MIL-STD-1316, MIL-STD-1911, MIL-STD-1901, MIL-STD-331, AOP-7, etc.). Evaluate sensitivity of in-line explosives, effectiveness of interruption of out-of-line explosives, integrity of safety features/locks, etc.

(e) Consideration of the age and safe service life of munitions. Assess effects of long-term storage, potential for degradation over time, etc.

(f) Consideration of previous environmental/geographical exposure, storage conditions, and effects on munitions.

## C. Environment and Safety

1. USSOCOM personnel at Ft. Bragg assume that the foreign ammunition that they receive from BGMC is safe and reliable. BGMC has little information to make such assessments reliably. They are limited to visual inspections based on analogy to similar U.S. items and cannot provide the same level of confidence as with U.S. munitions.

2. Disposal sometimes poses a problem. Crane, for example, will not accept nonstandard ammunition for destruction because it is not listed in MIDAS. Without precise data about the materials used in the ammunition, compliance with environmental rules is difficult.

3. Some organizations maintain small missile items like Hellfires, TOWs, Man-portable air-defense systems (MANPADS), etc. with double-base propellants that may have been in storage at high temperatures. The stabilizer content of these propellants is not known or being tested.

## D. Processes

1. As a result of the May accident, on 12 June 2009 the ARL issued a memorandum limiting use of FOM to remote firing only (Ref. 5). In light of the findings of this Research Team, we believe the Work Group should consider what restrictions the Army should adopt for employing ammunition for which we have little technical information or lifecycle history.

2. Foreign/nonstandard munitions should not undergo manned firings (testing, demonstrations, or training) unless compelling evidence exists to conclude that manned firings can be conducted safely. In those cases where it is necessary such as some of USSOCOM's core mission to assist in training our allies, both the soldiers and commanders need to understand and accept the added risks.

3. All the test centers that we visited have a process whereby risks posed for every test are evaluated through a formal process that must then get approval from the appropriate management level prior to the test being conducted. It was not clear that the risks posed by the ammunition to be used in tests were always included in the risk analysis. Aberdeen has established an Automated Risk Assessment process that all tenant activities may use to help assess those risks and determine the approval authority.

4. One of the difficulties faced at the test centers is that a large number of individuals are authorized to purchase nonstandard ammunition and they do so from a large number of commercial vendors and foreign brokers. In addition, they sometimes will ask the NGIC to provide small quantities of foreign ammunition when sufficient quantities from NGIC's sources are being stored.

5. One of the initiatives Aberdeen is taking to address these concerns is that they are in the process of developing an external SOP to establish uniform procedures and safety measures that all purchasers and suppliers will follow. This effort ought to be shared with the other test centers for them to consider.

6. The Developmental Test Command (DTC) does not conduct any testing without a SAR. They will often administratively assign a “High Risk” in their Safety Confirmation to an item for which very little data is available.

7. USSOCOM inspects the foreign weapons that they employ at 18-month intervals to include magnaflux testing of each weapon. In some cases, weapons have been manufactured to international standards, the factory performs high-pressure tests and they do have proof marks. Some other weapons do not have the same level of testing and do not have proof marks. In some cases, then, the weapons employed may also increase the risk to the soldier, not only the ammunition. USSOCOM is working with the United States Marine Corps (USMC) on developing operating manuals for foreign weapon systems. Packages are being prepared by USSOCOM to submit to DTC for conditional safety confirmation.

## **E. Storage of Stockpiles of Foreign/Nonstandard Munitions**

1. Various facilities contain significant stockpiles of foreign/nonstandard munitions. The safety and suitability of many of these stockpiles for long-term storage, transportation, and handling is unknown. In many cases, periodic surveillance inspections are not performed on assets in storage. There is no storage history available, no inspection criteria, no measures of deterioration or chemical stability, and no knowledge of environmental effects that may affect the ammunition. Yet, these items are being stored in U.S. Army facilities and shipped on commercial transport under U.S. Army auspices.

2. Long-term storage is not recommended unless a surveillance program is in place to check periodically for degradation (e.g. propellant stability, etc.).

3. At two of the storage locations that we visited, LEMC and Redstone, there are large quantities of excess munitions being maintained although little storage history is available and few inspections are conducted. We also learned that Crane also has a large quantity of excess foreign material. The reasons these items are being retained are unclear. Some that we spoke with offered a “just in case” pretext. We learned at Redstone, for example, that EOD personnel from Picatinny had gone through their storage facilities a few years ago to select items they might want to use in future tests. We think the Work Group needs to consider a clear policy on retention decisions.

4. We learned of an incident at LEMC a few years ago that when they inspected some RPGs being readied for shipment they found a good number of them were in an armed position and they ended up individually inspecting some 10,000 of them as a result.

5. RPGs were also involved in some of our early experiences with safety concerns for foreign ammunition. During familiarization training, troops were experiencing both misfires and unexpected launches. At the time, it was thought to be the result of using the wrong launchers; RPG 7 rounds are not fired from RPG-2 launchers (Ref 7). In 2008, more questions were raised

for the same concern on the Counter-Insurgency (COIN) forum on the Battlefield Command Knowledge System (BCKS).

## F. Exploitation

1. The challenges posed by NGIC's exploitation mission are unique. As discussed elsewhere in this report the process they must apply to assign IHCs is imprecise. Beyond that, however, once exploitation has been completed and the data needed to properly describe the content and its fusing mechanisms has been obtained, the practice is to treat the items as if they were as safe as U.S. produced ammunition
2. When it is necessary to ship NGIC items to other locations, the Materiel Operations Division will send a DD Form 1149 along with an MRO in the form of a memorandum directing the shipment. The MRO includes this statement, "These items are certified to be safe for handling, storage, and transportation" (Ref.4). This certification is based on the experience of the exploitation team, analogy to U.S. items, and past experience with similar or like items. It is not based on the same level of testing that U.S. items receive. The Research Team found no evidence that comprehensive safety assessments were conducted which could support these conclusions, or even that appropriate subject matter experts were involved in making these conclusions.
3. We learned of one case where an item was sent from Germany for exploitation that was hazard class 1.1. It was received at Aberdeen through the U.S. mail sent via the U.S. embassy in Germany.
4. X-ray is an important diagnostic tool for exploitation to get an understanding of the inner workings of a munitions item and its safety features. For most of the NGIC items being collected in SWA, x-rays are not conducted until the munitions arrive at Aberdeen.
5. The NGIC at Aberdeen relies on the Garrison Safety Office for safety support; it does not have its own safety office.
6. NGIC has a wealth of information on the hundreds of foreign items they have evaluated over the years. Much of it is catalogued and published for their use. They also provided the team with an Eastern European document that provides the number of years those nations felt that different types of items should be kept in service (Ref. 6).

## V. STOCKPILE RELIABILITY PROGRAMS AND SHELF LIFE

**A. Background.** Army Regulation (AR) 702-6 establishes the Army's Ammunition Stockpile Reliability Program (ASRP). "The ASRP provides 'cradle to grave' responsibilities, to include demilitarization, for monitoring the performance, reliability, and safety characteristics of ammunition items and class V components. The ASRP consists of the ammunition surveillance program, Research, Development, Test & Evaluation (RDT&E) elements, stockpile function test program, and stockpile laboratory test program. It also allows for the extension of shelf life or certification life by the use of scientific facts that save the taxpayer money, keeps the manufacture base current, and most of all the best ammunition available to the military members. Depending on the type and nature of the ammunition item to be evaluated, any part or all of these programs will be used."

1. The ASRP for all conventional ammunition is managed by JMC, while the missile ASRP is managed by AMRDEC. However, AR 702-6 was not written to encompass nonstandard/foreign ammunition, and neither agency has responsibility for these items. The most common ASRP approach for standard items involves pulling samples from the inventory for a combination of flight tests and disassembly for component tests/analysis. In almost all cases, there are too few items in a nonstandard/foreign inventory to support an ASRP. The closest example to a 'standard' Army inventory having this few items might be a complex, high dollar value missile system. However, the aging of these missile systems is extensively tested and analyzed during development, and they are supported by very expensive, minimally destructive ASRPs throughout their life.
2. In the US Ammunition Surveillance program, two important records are used. One is called the Ammunition Data Card (ADC). This card is similar to a birth certificate for the ammunition. It will list the lot number of the ammunition, the date of manufacture, the components and their lot numbers, the packaging, any deviations that were accepted with the lot, and the military or part number under which that ammunition lot was produced. The second record is called the Depot Surveillance Record (DSR) card. The DSR is similar to a medical record for the lot of ammunition. It will list all of the inspections of the lot of ammunition, any previous or current suspensions/restrictions, any previous repairs, maintenance upgrades, replacement of components, or adverse storage condition. The DSR will also list the current condition code (CC) of the ammunition. These two records are very import tools used in the management of ammunition.
3. The inspection criteria for US stocks of ammunition are spelled out in SB 742-1. This supply bulletin gives the inspections intervals for various types of inspections, lists defects, lists defect classifications, lists accept/reject criteria, and other guidance for all types of US conventional ammunition. It has appendices for special inspection criteria and lists additional inspection criteria for some conventional ammunition items. US manufactured ammunition is a known commodity with known standards. It is produced, shipped, stored, inspected, maintained, used, and destroyed in a specific scientific way. There are available regulations, technical manuals, etc. to find data and instructions on each step of each process.
4. With nonstandard and foreign ammunition, we do not have the same luxury. Many times, there are no reference manuals on the nonstandard and foreign ammunition. Some

persons have made the statement that if the nonstandard or foreign ammunition looks like US conventional ammunition then we can assume that it is. The incident that caused this study involved an uploaded tank round. From the outside this uploaded tank round looked exactly like a US round. The foreign round had a different fuzing mechanism that one could not determine by looking at externally.

5. None of the agencies the team visited is performing more than periodic surveillance (visual inspections) of their nonstandard/foreign assets. In general, this should not be discouraged and is highly recommended, even if the method of inspection can only be based on similar items. However, no functional or laboratory testing is being performed to assess their continuing safety. Even if standard Army items become obsolete, JMC and AMRDEC have responsibility to evaluate their continuing safety to handle/store using the ASRP. This especially applies to the laboratory analysis of aging energetic materials (propellants or high explosives) for stability or sensitivity. These are components in many of the nonstandard/foreign items being stored, and they are potential risks for spontaneous ignition - even in stationary storage. In many of the foreign exploitation cases, agencies such as ARL and WDI are performing analysis to determine the ingredients in the energetic components. In some cases, based on similar materials, these agencies might provide a safety-of-storage/handling shelf life projection.

6. Shelf life is utilized for some Army standard ammunition items (missile systems and Cartridge Actuated Devices/ Propellant Actuated Devices (CADS/PADS)). These items are immediately restricted from use when they exceed their shelf life. If the ASRP has collected sufficient information to determine that the item is still safe and reliable, the shelf life may be extended. The table that we received at NGIC, which gave the shelf life for Soviet type/style ammunition, may be of value but it is unclear how accurate this listing is. The engineers, testing folks, labs, statisticians and so forth will need to review and decide whether it is sufficiently accurate. Manufacturers are providing shelf life information on new production. This information should be requested when acquiring items and shared with the agencies using the munitions. Without additional data to support an extension, functional use of any item beyond its shelf life should be considered high risk, and remote initiation required. The 'safe to store and handle' often goes far beyond the original operational shelf life but is not indefinite. Agencies need to identify aggressively any nonstandard/foreign items that are no longer required and support their timely demilitarization.

7. Bottom line is that there needs to be some criteria defined to inspect, store, and ship these nonstandard and foreign types of ammunition. The standards may be different from US standards but there needs to be something available when the ammunition arrives at a location. With small quantities of one's or two's of some captured enemy ammunition, it may be very difficult to provide information. As a minimum, the information should explain what the explosives content is and how the ammunition item functions. In addition, individual users should set standards, when possible, for employing nonstandard ammunition and assure risk analysis is accomplished when the standard is not met.

8. The team understands that the missions sometimes change. We were told that the ammunition stored by SOF at BGMC would only be issued for training and to US troops only. In Reference 1, you can see where some of this ammunition was requested for a Foreign Military Sales (FMS) case clearance to Pakistan. The criteria that JMC uses to provide functional

clearance for ammunition being provided under FMS cannot be met by unknown foreign ammunition.

9. Issues are being reported to HQ JMC, Surveillance Office on nonstandard and foreign ammunition being turned into ASPs in Iraq, Afghanistan, and Kuwait. This is to be expected during a war. Because little information is available (inspection criteria, tech manuals, tech data sheets, etc) most of it is transferred to the local demo ground for emergency destruction. Some small-arms ammunition if visually serviceable may be saved for future use in cross training of local allies. Some of this same ammunition is also showing back up in the US at local ASPs or in vehicles that return from the war zone.

10. Along the same line, there are certain “special” ammunition items that are intended to be used only by SOF. However, we have noticed in theater that there are times when this materiel makes its way to a line unit and they may not have the training needed to employ it. An example of this was the Charge Diversionary Grenade MK 141-0 (DODIC DWBS). This grenade caused problems in both Iraq and Afghanistan by going off faster than expected and blowing fingers or entire hands off soldiers that did not know or understand the risks involved in using the grenade.

11. The US Army conventional ammunition community has a means to notify the field immediately of ammunition issues such as safety changes to regulations, handling procedures, firing adjustments, etc. This is by an Ammunition Information Notice (AIN). This system issues AINs from HQs, JMC. An AIN is sent out on a worldwide notification that goes to all services and to all persons that have any interest in ammunition. All one has to do is request to be placed on the listing for AINs. A PM, PEO, Item Manager, Safety Manager, Surveillance Chief, contacts HQ JMC, AMSJM-QAS to send out an AIN. The requestor is listed as the POC and the message is sent out.

12. The PD NSA office maintains a database of information on the items that they procure to include ammo data cards, lot acceptance test reports, top-level drawings, etc.

13. The NGIC has extensive catalogs of foreign ammunition that they have evaluated over the years. These contain some of the basic information on the quantity and type of explosives involved, some assembly details, and the safety measures used.

## B. ASRP Conclusions

### 1. Condition Codes:

(a) There seems to be a lack of understanding of condition codes (CC) in the nonstandard and foreign ammunition community. The definitions are given in DODD 5160.65. These definitions apply to standard U.S. ammunition developed, tested, stored and inspected under U.S. standards. Application of them for nonstandard ammunition is problematic; they do not really apply because inspections and tests are not being conducted. Four condition codes are considered serviceable, A, B, C & D. The biggest issues appear to be with CC-B and CC-D.

(b) CC-B is a serviceable condition code (issuable with qualification). Ammunition in CC-B will have specific restrictions placed on its use, such as restricted to certain weapons or to temperature limits. A great many folks believe CC-B is for training use only because this is one

of the most common restrictions. Training use only, though, is just one example of CC-B but there are many other qualifications or restrictions.

(c) CC-D is serviceable materiel that requires test, alteration, modification, conversion, or disassembly. CC-D is frequently used at a Proving Ground, Lab, or Test Facility. For test purposes, nonstandard and foreign ammunition is usually issued in CC-D, the assumption being made by the supply community that the test directors are familiar with the nature of the munitions and will take appropriate precautions.

2. Better communication with all persons within the nonstandard and foreign ammunition community will correct many of the current deficiencies noted. Information needs to be shared so we can assure the soldier is provided the best product and ammunition in the field. If there are some items that are classified we need to assure that we use the classified systems that we have in place to communicate that data. Some information is available but not everyone is aware of it.

## VI. INTERIM HAZARD CLASSIFICATION

**A. Background:** The Department of Transportation (DOT) requires that all dangerous goods have a hazard classification based on tests conducted on the items in the packaging in which it is being shipped. The packaging must provide certain levels of protection as specified in the U.S. Code of Federal Regulations, Title 49. These same standards are required to be met in international shipping. In those cases where the tests have not been conducted, such as when new materiel is being shipped to be tested or when materiel which does not have sufficient quantities to warrant testing, the DOT authorizes DOD to assign an IHC provided certain limited information is available and competent individuals assess the shipment as safe.

### **B. Processes**

1. The intelligence community collects foreign munitions, often of unknown pedigree or condition, for shipment to the U.S. for intelligence gathering and exploitation activities. The first step in dealing with all nonstandard ammunition, especially foreign munitions, is to identify the nature of the hazards involved in order to qualify the items for shipment and then obtain an IHC. Munitions are obtained through various means, including field recovery. EOD technicians are typically deployed to the foreign source to collect, visually inspect and package items for transportation. Because the hazard classification process specifically excludes some considerations from its testing process, the team must first assess such things as electrostatic and electromagnetic influence, rough handling and vibration, effects of exposure to hot and cold environments, mechanical defects, solar radiation, temperature shock, abnormal functioning, or combat exposure. The team coordinates a request for an IHC through channels and receives one prior to shipment. IHCs are assigned by NGIC (see paragraph 6 below) based on an in-theatre assessment (e.g. visual examination by EOD, and sometimes by personnel from the HMTO and/or general familiarity of items from various reference sources (Jane's Ammunition Handbook, EOD, and Intelligence resources, etc.). Items are often assumed safe for transportation, handling, and storage unless gross anomalies are noted during visual inspection.

2. "Black box" munitions (e.g. IEDs) are shipped to the U.S. where they are disassembled and analyzed to determine contents, characteristics, provide forensics data, etc. Hazard Classifications have been assigned based on limited technical data/information (e.g. explosive compositions, sensitivity, and stability data may be unknown) to satisfy the needs of the intelligence community to ship foreign items to the U.S., but there are risks associated with transportation, handling and storage of foreign munitions with unknown or incompletely defined safety characteristics. A dichotomy exists between safety vs. intelligence requirements (i.e., the intelligence community requires shipment of assets to the U.S. to determine their content, characteristics, capabilities, etc.; however, assets cannot legitimately be assessed as safe for transportation without knowing their content and characteristics). It is not clear if the potential risks presented by this dichotomy have been acknowledged and accepted by appropriate authorities. If so, the risks have not been properly communicated to all personnel involved with transportation, handling, storage, and testing of foreign munitions.

3. An IHC differs significantly from a Final Hazard Classification (FHC) that is only issued after an item has undergone a significant series of tests using sufficient sample sizes in accordance with Technical Bulletin (TB) 700-2, Department Of Defense Ammunition And

Explosives Hazard Classification Procedures. Each nation involved in international shipments of hazardous materiel is required to identify a Competent Authority (CA) to establish accurate hazard classifications. For the U.S., that authority rests with the Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). They, in turn, have delegated authorities within the services to classify Hazard Classification 1 (Explosives) material in accordance with the TB. For the Army, DOT designated the U.S. Army Technical Center for Explosives Safety (USATCES) as that authority. The Department of Defense Explosives Safety Board (DDESB) oversees the Classification process of all the services.

4. For some items, such as those in development, experimental items, prototypes, unique configurations, etc. and foreign items obtained in small quantities, conducting the TB 700-2 tests is impractical. The TB accounts for this need by establishing an IHC. The specific information needed to assign an IHC is listed in paragraph 7-4a:

- (a) Item nomenclature
- (b) Part numbers
- (c) Prime Contractor
- (d) Vendor
- (e) National stock number, part number or other unique identifier
- (f) System the item is associated with
- (g) Next higher assembly item is used with
- (h) Size of unpackaged item
- (i) Weight of unpackaged item
- (j) Explosive compositions
- (k) Net explosive weight
- (l) Physical description of item
- (m) Functional description of item
- (n) Packaging data
- (o) Description of fuze safety features

5. USATCES has delegated certain individuals at Aberdeen, Picatinny, and Redstone to assign IHCs for items that they are familiar with and for which they have the needed information. The names of each of these individuals are specifically registered with the PHMSA. USATCES also issues IHCs for other customers. This method is a little different for foreign ammunition brought in by the NGIC for exploitation.

6. The NGIC receives its IHCs from USATCES except for the initial exploitation period before the item has gone through the exploitation process. In these cases, usually as a result of battlefield collection, but also for other means of collection, the authority to issue IHCs has been delegated to specific personnel in the NGIC and restricted to the initial transportation for exploitation. After the exploitation process, subsequent IHCs are issued by USATCES. The NGIC issues these initial IHCs based on information provided by personnel of the EOD unit and/or the HMTO of the DIA. The HMTO is not involved in all such efforts, however, and the NGIC must consult with those on the ground to determine the nature of the material in question, assure render-safe procedures have been taken, and decide whether the material is safe to ship for exploitation. In most cases, the IHC is issued with the highest possible classification, 1.1, until examination justifies that a different classification is warranted.

7. USATCES maintains an ACCESS database of all the IHCs that it issues but there is no centralized database of all IHCs being issued by all the various entities. This condition has been identified by JMC as causing some difficulties in their transportation processes because there is no means of validating the IHC issuance or obtaining duplicate copies of the needed paperwork when necessary. In addition, the scarcity of technical data and identifying information, especially with foreign munitions will lead to incorrect assignments of new items with existing ones and will reduce, but not remove, the possibility of duplicate entries. This area needs further examination.

8. Personnel at the various U.S. facilities responsible for handling and storing foreign munitions generally assume that items are safe for transportation, handling, and storage since they are received through Government channels with an Interim Hazard Classification (IHC) assigned. The general thinking is “it must be safe because it has an IHC assigned, it survived the transportation and handling needed to get here, and they would not have shipped it here if it wasn’t safe”. However, this may not be a valid assumption, since the IHCs are often assigned based on limited data, and there are additional factors that should be considered when assessing if munitions are safe for transportation, handling and storage beyond those normally considered during an IHC assignment.

9. Agencies responsible for transportation and storage of foreign/nonstandard munitions should develop processes, policies, and procedures to conduct System Safety Assessments in as comprehensive a fashion as possible to evaluate if foreign/nonstandard munitions are safe and suitable for transportation, handling, and storage. Agencies should provide the work force to conduct these assessments by suitable subject matter experts (i.e. System Safety/Munitions Safety experts). Where these assessments are inconclusive due to limited data, the potential risks should be acknowledged, and if accepted by appropriate authorities, communicated to those personnel involved with handling and storage of these munitions.

10. In cases where the pedigree, technical and qualification data, condition, storage history, etc. are unknown, visual inspections should be supplemented by x-rays whenever possible to assist in determining the munitions condition and to better assess safety and suitability for transportation, handling, and storage.

11. Another problem identified during the visit to APG is that the ASP there insists that all foreign ammunition received must have a FOM number. Not every installation assigns FOM numbers and material shipped to APG without a FOM is held until the NGIC can assign a FOM. Until a uniform numbering system is adopted by all parties for foreign ammunition, each location must accept the systems used by others when the materiel is moved between them. To reassign identifying numbers in a different system leads to confusion for all. In this case, the process used to make this assignment was accomplished by the issuance of a new IHC. This is not an appropriate use of the NGIC's IHC authority. The correct IHC to be associated with that material is the one issued originally and used for the shipment to APG. NGIC was notified of this and said they would take corrective action immediately.

**C. IHC Conclusions.** The Research Team believes that the NGIC exploitation process warrants further examination to assure adequate controls are in place and determine whether an alternate

process can be developed which will still meet mission needs. This is especially true for the initial decision on transporting materiel in order to conduct the exploitation.

## VII. FOREIGN AMMUNITION PROCUREMENT

**A. Background:** Standard training ammunition in support of approved weapons training strategies is programmed annually during the Program Objective Memorandum (POM) budget process. When a new ammunition item requirement is identified and approved, a minimum of five years may be needed to build the requirement into the POM, receive congressional approval for funding, obligate approved funds, and receive the munitions into the stockpile. Department of Army (DA) directives prohibit Army Commands (ARCOMs) and individual installations from purchasing standard and nonstandard munitions with anything other than Procurement Ammunition - Army (PAA) funds, which are controlled by DA. When an urgent need exists for a nonstandard ammunition item, a written justification to DA G-3 begins the procurement process, and if approved, DA G4 funds the procurement. USSOCOM does not need to follow the Army ammunition procurement process. USSOCOM has Title 10 Acquisition Authority.

### B. Procurement Practices

1. Fort Bragg Armament Facility. Ft Bragg does not procure ammunition of any type. The procurement of nonstandard/foreign ammunition for weapons testing and training is done at MacDill AFB. When possible, USSOCOM will procure foreign ammunition through formal contract acquisition under standards equivalent to those of the other services. The Foreign Comparative Test Program is utilized to buy ammunition, and purchases are documented and fully qualified through the Army Fuze Safety Review Board (AFSRB) and the Weapons Systems Explosives Safety Review Board (WSESRB), as described in USSOCOM directives.
2. U.S. Army Armament Research, Development and Engineering Center (ARDEC) USSOCOM Cell. Contract requirements are based on technical performance specifications identified by USSOCOM. All deliveries are received and stored at BGMC. Lot samples are shipped to ARDEC for function and acceptance testing. Testing includes developing pressure/time curves, temperature conditioning, functioning, and casualty testing at temperature, dimensional inspections, charge weight determinations, etc. Test information, along with foreign manufacturer's acceptance testing data is collected and documented. SOF uses the Military Interdepartmental Purchase Request (MIPR) process to fund ARDEC for nonstandard/foreign ammunition purchases. Upon receipt of the MIPR, ARDEC notifies BGMC to release the ammunition for use.
3. JM&L LCMC, PD-NSA. PD-NSA, in coordination with the US Army Contracting Command (ACC), procures nonstandard/foreign ammunition for the Army for the governments of Iraq and Afghanistan. Market Surveys are done to identify potential sources and vendors capable of providing multiple variants of nonstandard ammunition. The Defense Contract Management Agency (DCMA) performs quality and acceptance audits at foreign manufacturing plants. Contracts typically call for technical and lot data history (technical data is the product specific technical drawing and Quality Assurance (QA) requirements to which ammunition and associated packaging is produced and accepted for each applicable contract). DCMA auditors review testing criteria and ensure technical requirements identified in procurement contracts meet the stated requirements. Verification procedures would include random samplings of function, packaging, and marking information (the contractor is responsible for Lot Acceptance

Testing (LAT), but the U.S. Government reserves the right to require verification testing). It is the contractor's responsibility to transport ammunition to receipt at its final destination.

4. ARDEC, EOD Technology. Nonstandard/foreign ammunition obtained for EOD exploitation purposes is generally provided by NGIC. This ammunition is obtained through a variety of sources, to include battlefield pickups and purchased through formal procurement channels. Technical histories (if available) are not formally maintained.

5. ARDEC, FIO. ARDEC When notified of an exploitation need, EOD technicians are deployed to the foreign source to collect and properly pack these items for transportation. Munitions are typically shipped to APG, LEMC, or Picatinny Arsenal for storage and eventual breakdown.

6. U.S. Army Test and Evaluation Command (ATEC). ATEC procures nonstandard/foreign ammunition from a variety of sources, to include NGIC, commercial vendors, foreign manufacturers, and local retail establishments. No single source of procurement exists that could satisfy mission requirements.

7. Garrison Aberdeen Proving Ground (GAPG). All test organizations at GAPG have purchase authority for ammunition. Ammunition is received from several sources, including; internet retailers, local gun stores, foreign manufacturers and vendors. Receipts are delivered to the GAPG ASP Minimal technical information is available on most purchases and comparison profiling is used for safe storage and handling purposes.

8. National Ground Intelligence Center (NGIC). Ammunition received for exploitation is obtained from several sources to include; battlefield pickups, government to government contracts, foreign manufacturers and vendors. NGIC uses a "Foreign Material Acquisition Requirement" document to identify an ammunition item for procurement. The HMTO is used to secure ammunition that is available from battlefield operations. HMTO deploys a team of EOD and transportation experts to foreign countries to prepare ammunition for safe shipment. The team coordinates IHC and packaging requirements with NGIC prior to military air shipment.

9. MSIC. Ammunition needed for intelligence exploitation is received through battlefield collections and formal acquisitions. HMTO and EOD technicians from MSIC deploy to foreign locations to properly secure and pack explosive items for safe transport and storage.

## C. Procurement Summary/Conclusion

1. Differences exist in the acquisition process and business approach used by agencies to obtain nonstandard/foreign ammunition. Each activity the team reviewed has unique requirements and capabilities to procure ammunition. Uncertainties in the quality and safety of battlefield acquisitions will always exist, but the practice is needed to gain valuable intelligence information. While we did not note any problems with the contracting systems in place, the acquisition approach of PD-NSA seems to allow for more centralized oversight of nonstandard/foreign ammunition purchases, and ensures quality standards are identified and incorporated in the final product. The Principal Deputy Assistant Secretary of the Army (Acquisition, Logistics and Technology) recognizes the importance of centralized procurement, and in an 8 August 2008 memorandum established a procurement policy for nonstandard

ammunition for the Army (Ref. 2). The policy directs that all U.S. Army nonstandard ammunition procurements be forwarded to the PEO-Ammunition to execute. Furthermore, PEO Ammo, in collaboration with the Single Manager for Conventional Ammunition, will work closely with all Services to coordinate support and execute their nonstandard ammunition acquisition requirements. “If valid reasons exist, making it impractical for PEO Ammo, such as urgency, the procuring organization will coordinate with PEO Ammo, in writing, detailing the best methods to leverage the established requirements, experience, and knowledge that PEO Ammo has gained in the acquisition of nonstandard ammunition.”

2. Foreign/Nonstandard Munitions procured for Foreign Military Sales (FMS) have not been U.S. Safety Certified and Type Classified and cannot be procured for Army use. Current practice to ship directly from foreign manufacturing plants to foreign services without intersecting U.S. military installations should be maintained. In the event that transportation to U.S. military installations is desired, the procurement specification requirements should be expanded to include safety criteria to ensure safety during transportation, handling, and storage of FMS munitions. As noted in the ASRP section, foreign ammunition cannot be functionally cleared for FMS shipment as is required for U.S. ammunition.

3. In Oct 07, a Memorandum of Agreement (MOA) was signed between the USSOCOM Acquisition Executive and the Assistant Secretary of the Army, Navy, and Air Force. (Ref. 8) This MOA stated that acquisition programs within USSOCOM are joint programs that support SOF components, and delineated the responsibilities and procedures for implementing and managing a Joint safety review and approval process for USSOCOM funded programs. A guide was prepared “Joint Systems Safety Review Guide for USSOCOM Programs,” dated 12 Oct 07 (Ref. 9) which outlines the process to accomplish efficient and effective Joint Safety reviews for weapon systems and munitions in support of USSOCOM Joint acquisition program needs. The guidance implementing the Joint Process was not retroactive and has not been applied to the Nonstandard Materiel program. Foreign weapons and ammunition procured by this program continued to use existing processes. The Nonstandard Materiel program is now working to have foreign weapons and munitions approved through the Joint Safety Review Process. The nature of these procurements (no U.S. configuration control, limited technical data, etc.) will pose a challenge to collecting all the safety case evidence needed to support a Safety Certification, particularly for munitions containing fuze initiated high explosive filled projectiles (e.g. rocket propelled grenades).

4. In 1996, USSOCOM established a Capstone Requirements Document (CRD) (Ref. 11) to govern its unique needs. Their office at ARDEC oversees its procurements and they are working with the PD-NSA to meld their needs into the PD-NSA’s operations.

5. USSOCOM is a separate “Service-like” organization with Title 10 Acquisition Authority and does not answer to, or follow, Army or any other service policies. USSOCOM uses a procedure called Fielding and Deployment Release (F&DR).

6. The Army has a standard process for type classification and Materiel Release/Fielding of munitions (AR700-142). However, the Research Team learned that NGIC has been issuing “Materiel Release Orders” (Ref. 4) releasing foreign/nonstandard munitions that have not undergone this formal Materiel Release process. In the event that these NGIC practices are

allowed to continue, they should at a minimum, be based on sufficient Safety Case evidence to conclude that the munitions are safe for handling, storage, transportation, and use. Any residual risks should be properly assessed, documented, and approved prior to fielding.

7. DA policy for Nonstandard Ammunition and Explosives has been published using an AIN. (Ref. 14) This policy states that requests for each nonstandard munitions item must include a “written memo approved by O-6 or higher commander acknowledging and accepting the risk of using nonstandard ammunition by the command.” The Research Team has not seen any evidence that risks associated with fielding of foreign/nonstandard munitions have been documented and accepted.

8. “Materiel Release Orders” authorizing release of foreign/nonstandard munitions to “regular Army” should not be issued without undergoing a formal Materiel Release process as required per AR 700-142, Type Classification, Materiel Release, Fielding, and Transfer.

9. An acquisition strategy that recognizes the importance of obtaining technical data, lot histories, packaging standards, acceptance test reports, storage history, and ADC, mitigates the risks associated with nonstandard/foreign ammunition storage/transportation/use.

## *Appendix A - References*

1. **Email, Joint Munitions Command**, Tom Sears to Doug Maddox, Subject: NON STD FCR Requests, 8 February 2010 (cited in Section V-A-8)
2. **Memorandum, Department of the Army, Principal Deputy Assistant Secretary of the Army (Acquisition, Logistics and Technology) Memorandum**, Subject: Policy for Procurement of Nonstandard Ammunition, 8 August 2008 (cited in Section II-E-2a and VII-C-1)
3. **Memorandum, Department of the Army, Office of the Assistant Secretary of the Army Installations and Environment**, Subject: Army Safety Policy for Captured Enemy Ammunition, 28 June 2004
4. **Memorandum, Department of the Army, NGIC, Materiel Operations Division**, Subject: Materiel Release Order 20072076, dated 16 May 2008 (example, cited in Section II-F-2a, IV-F-2 and VII-C-6)
5. **Memorandum, Department of the Army, ARDEC, Army Research Laboratory**, Subject: Static Detonation and Remote Firing of Foreign Ordnance Munitions (FOM), 12 June 2010. (cited in Section III-B-6 and IV-D-1)
6. **NGIC Document**, Subject: Time to Test in Proving Grounds for War Supplies, undated. (cited in Section IV-F-6 )
7. **USASOC Bulletin RPG Accident**, Feb 03. (cited in Section IV-E-5)
8. **Memorandum of Agreement Among U.S. Special Operations Command (USSOCOM), Assistant Secretary of the Army (Acquisition, Logistics, & Technology), Assistant Secretary of the Navy (Research, Development, & Acquisition), Assistant Secretary of the Air Force (Acquisition)**, Subject: Joint Weapon, Munitions and Laser Safety Review and Approval Process in Support of USSOCOM, 2007 (cited in Section VII-C-3)
9. **Department of Defense, Joint Systems Safety Review Guide for USSOCOM Programs, Version 1.1** 12 October 2007 (cited in Section VII-C-3)
10. **Department of Defense, Office of the Secretary of Defense, Comparative Testing Office Handbook, (Advanced Systems and Concepts)**, December 2007
11. **U.S. Special Operations Command, Nonstandard Weapons, Materiel and Munitions Capstone Requirements Document (CRD)**, 6 June 2001 (cited in Section VII-C-4)
12. **General Specification for Nonstandard Ammunition (NSA)**, 29 May 2009
13. **NATO International Staff – Defense Investment Division, Allied Ordnance Publication, AOP-15 Edition 3, Guidance on the Assessment of the Safety and Suitability for Service of Non-Nuclear Munitions for NATO Armed Forces**, April 2009
14. **AIN 016-10, Nonstandard Ammunition and Explosives**, 9 November 2009 (cited in Section VII-C-7)
15. **AR 385-10, Army Safety Program**, 23 August 2007 (available online)
16. **AR 700-142, Type Classification, Materiel Release, Fielding, and Transfer**, 26 March 2008 (available online)
17. **AR 702-6, Ammunition Stockpile Reliability Program**, 23 June 2009 (cited in Section V-A)
18. **TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1, Joint Technical Bulletin: Department Of Defense Ammunition And Explosives Hazard Classification Procedures** 5 January 1998 (available online)
19. **Title 49, U.S. Code of Federal Regulations – Transportation** (available online)
20. **United Nations Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria**, 4<sup>th</sup> Edition, 2003. (available online)

## *Appendix B - Acronyms*

ACC	Army Contracting Command
ADC	Ammunition Data Card
AEC	Army Evaluation Center
AFB	Air Force Base
AFSRB	Army Fuze Safety Review Board
AMC	Army Materiel Command
AMCATS	Aviation and Missile Command Ammunition Tracking System
AMCOM	Army Aviation and Missile Command
AMMO	Ammunition
AMRDEC	Aviation and Missile Research Development and Engineering Center
APG	Aberdeen Proving Ground
ARCOM	Army Command
ARDEC	Army Armament Research, Development and Engineering Center
ARL	Army Research Laboratory
ASA (AL&T)	Assistant Secretary of the Army (Acquisition, Logistics and Technology)
ASC	Acquisition Support Center
ASP	Ammunition Supply Point
ASRP	Ammunition Stockpile Reliability Program
ATC	Aberdeen Test Center
ATEC	Army Test and Evaluation Command
ATF	Alcohol, Tobacco, and Firearms
BCKS	Battlefield Command Knowledge System
BGMC	Blue Grass Munitions Center
CA	Competent Authority
CADS/PADS	Cartridge Actuated Devices/Propellant Actuated Devices
CAGE	Commercial and Government Entity
CC	Condition Code
CFR	Code of Federal Regulations
COIN	Counter-Insurgency
CRD	Capstone Requirements Document
DA	Department of the Army
DCMA	Defense Contract Management Agency
DDESB	Department of Defense Explosives Safety Board
DIA	Defense Intelligence Agency
DOD	Department of Defense
DODIC	Department of Defense Identification Code
DPAS	Defense Property Accountability System
DOT	Department of Transportation
DSR	Depot Surveillance Record
DTC	Army Developmental Test Command

## ***Appendix B - Acronyms***

EDES	Executive Director for Explosives Safety
EOD	Explosive Ordnance Disposal
F&DR	Fielding & Deployment Release
FCR	Functional Clearance Request
FID	Foreign Identification Designator
FIO	Foreign Intelligence Office
FMER	Foreign Material Exploitation Report
FMS	Foreign Military Sales
FOM	Foreign Ordnance Material
FORMMS	Foreign Material Management System
GAPG	Garrison Aberdeen Proving Ground
HAWG	Hazard Analysis Work Group
HMTO	Hazardous Materiel Transportation Office
IED	Improvised Explosive Devise
IHC	Interim Hazard Class
ISSA	Inter-Service Support Agreement
JCET	Joint Combined Exchange Training
JM&L LCMC	Joint Munitions & Lethality Life Cycle Management Command
JMC	Joint Munitions Command
LAT	Lot Acceptance Testing
LEMC	Letterkenny Munitions Center
MCN	Management Control Number
MIPR	Military Interdepartmental Purchase Request
MOA	Memorandum of Agreement
MOD	Mobile Ordnance Disrupter
MRO	Materiel Release Order
MSIC	Missile and Space Intelligence Center
NASA	National Aeronautics and Space Administration
NGIC	National Ground Intelligence Center
NSA	Nonstandard Ammunition
NSN	National Stock Number
OMEMS	Ordnance Munitions and Electronics Management School
OTC	Army Operational Test Command
PAA	Procurement Army Ammunition
PD-NSA	Product Director, Nonstandard Ammunition
PEO	Program Executive Office
POC	Point of Contact
POM	Program Objective Memorandum
QA	Quality Assurance
QASAS	Quality Assurance Specialists (Ammunition Surveillance)

## ***Appendix B - Acronyms***

PHMSA	Pipeline and Hazardous Materials Safety Administration
R&D	Research and Development
RDT&E	Research, Development, Test & Evaluation
RPG	Rocket Propelled Grenade
RTTC	Redstone Technical Test Center
SAA	Small Arms Ammunition
SAAS	Standard Army Ammunition System
SAP	Systems Applications and Products
SAR	Safety Assessment Report
SDS	Standard Depot System
SES	Senior Executive Service
SIPRNET	Secret Internet Protocol Router Network
SOF	Special Operations Forces
SOP	Standing Operating Procedures
TMS	Training Munitions Supervisor
TOW	Tube Launched, Optically Tracked, Wire Guided (a type of missile)
UN	United Nations
USATCES	U.S. Army Technical Center for Explosives Safety
USMC	United States Marine Corps
USSOCOM	United States Special Operations Command
WDI	Weapons Development and Integration (AMRDEC Directorate)
WSESRB	Weapons Systems Explosives Safety Review Board
WSMR	White Sands Missile Range



# Non-Standard/Foreign Ammo Work Group and Research Team

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# Non-Standard/Foreign Ammo Work Group



## Agenda

- ✓ Mission and Scope
- ✓ Work Group Membership
- ✓ Non-standard Definition
- ✓ The Issue Addressed
- ✓ Research Team
- ✓ Sources of Non-standard Munitions
- ✓ General Findings
  - Intelligence & Exploitation
  - Test & Evaluation
  - Soldier Training
- ✓ Research Team Results - Strengths
- ✓ Research Team Results - Improvements
- ✓ Conclusion

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# Non-Standard/Foreign Ammo Work Group



**MISSION** To research any organizational procedures/practices pertaining to management of non-standard and foreign munitions, and provide suggestions for improvement to any existing standards.

**Scope/Objective:** The group will assess safety standards for non-standard and foreign munitions retained in U.S. Storage and test facilities, and identify challenges facing the special operations, test, research, development, and intelligence communities who deal with these items. Members of the group will identify best practices currently employed by those users and suggest improvements to any existing standards. These findings will then be used to propose new standards and/or requirements for consideration. Recommendations from the working group will be coordinated with Army Material Command (AMC) and the Joint Munitions & Lethality Life Cycle Management Command (JM&L LCMC) and the Department of the Army Explosives Safety Council (DAESC).

**Method Of Operation:** A small research team comprised of specialists familiar with the assessment process currently applied to U.S. Army munitions will gather data from organizations with a non-standard/foreign ammunition mission. The research team will analyze the information gathered, identify best practices being employed, and make recommendations with an eye toward improving communications and standardizing processes among the stakeholders.

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# Non-Standard/Foreign Ammo Work Group



## Group Membership

- ✓ The research team:
  - U.S. Army Technical Center for Explosives Safety (USATCES) (Chairman)
  - Defense Ammunition Center (DAC)
  - Joint Munitions Command (JMC),
  - Armament Research, Development and Engineering Center (ARDEC)
  - Aviation and Missile Research Development and Engineering Center (AMRDEC)
- ✓ The following are identified as key members of the Non-Standard/Foreign Ammunition Work Group:

AMC	AMCOM	AMCOM LCMC	AMRDEC	APG
ARDEC	ATC	BGAD	DA-G4	DASA(ESOH)
DASAF	DTRA	FORSCOM	IMCOM	INSCOM
JM&L LCMC	JMC	NGIC	PD-NSA	PEO-AMMO
PEO-M&S	PM-MAS	SMDC	USASOC	USATCES
TRADOC				

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# Non-Standard/Foreign Ammo Work Group



## Definition

- ✓ **Non Standard Munitions:** “Nonstandard munitions are those munitions and explosives that have not completed safety type classification, do not have a National Stock Number (NSN) or DODIC, and are not available for procurement through the Defense supply system.” AR 5-13 Glossary
- ✓ Includes foreign ammunition, commercial items, and items modified or prototypes developed for test and evaluation purposes.

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# Non-Standard/Foreign Ammo Work Group



## The Issue

### Known

- ✓ Non-standard munitions have not been tested to US Army Safety standards
- ✓ Non-standard munitions are used by a wide variety of Army organizations
  - Test and Evaluation Community
    - Tests foreign/non-standard munitions
    - Test other items against known threats
    - Conduct tests themselves with commercial explosives
  - Intelligence Community for exploitation
  - Special Operations Community for training
- ✓ Also procured by the U.S. Army for use by foreign allies
- ✓ Issue is not unique to the Army or even to DOD
- ✓ USASOC uses foreign ammo extensively to support core missions

### Unknown

- ✓ Extent of non-standard being stored
- ✓ Accounting systems employed
- ✓ Means of surveillance to assure safety and reliability
- ✓ Extent of communication among these groups
- ✓ Army-wide policy for the use of non-standard munitions

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# Non-Standard/Foreign Ammo Work Group



## Research Team

- ✓ Visited locations with significant involvement:

Picatinny	Ft. Bragg	Bluegrass
Aberdeen	Redstone	Letterkenny
- ✓ Observe how Non-Standard Ammo is managed and tracked at each site
- ✓ Develop the scope and extent of the unknowns
- ✓ Recommend areas for the work group to develop solutions
- ✓ Identify best practices and opportunities to share and leverage them among Stakeholders



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# Non-Standard/Foreign Ammo Work Group



## Sources of Non-standard Munitions

- ✓ In April 2008, the JM&L, LCMC CG established a task force in response to an incident involving a U.S. contractor providing sub-standard foreign ammunition to Afghanistan allies. The task force was established to develop and implement processes for managing and procuring non-standard ammunition within the US Army.
- ✓ In August 2008, Dean G. Popps, the Principal Deputy Assistant Secretary of the Army for Acquisition, Logistics and Technology directed that all U.S. Army non-standard ammunition procurements be forwarded to the PEO-Ammo to execute. That task is assigned to the PD-NSA.
- ✓ Procedures are under development to assure that the PD-NSA is involved in all non-standard procurements.
- ✓ Non-standard and foreign ammunition obtained for exploitation purposes is frequently not “procured” but acquired by other means

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# Non-Standard/Foreign Ammo Work Group



## General Findings

- ✓ Non-standard ammunition is stored and treated similar to U.S. munitions but does not have the same technical data, lot history and surveillance as U.S. munitions
- ✓ Accountability exists, but no common processes are used
- ✓ Nonstandard materiel is released for use at the depots and ASPs without any formal process
- ✓ Technical data for ammunition gathered for exploitation is very limited.
- ✓ No evaluation of the aging characteristics to determine the continuing safety to store
- ✓ Multiple storage, access, safety, and transportation processes at different installations (no standard processes)
- ✓ No cross referencing and little cataloging of technical data that has been gathered over the years.
- ✓ No single entity identified & funded to take needed actions
- ✓ Disposal of non-standard materiel is complicated by unknown materials that may have environmental impact

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# Non-Standard/Foreign Ammo Work Group



## Principal Intelligence and Exploitation Findings

- ✓ **Exploitation is inherently dangerous because we are dealing with unknown materiel and conditions**
- ✓ **Materiel gathered overseas is shipped back to the U.S. for exploitation**
  - Interim Hazard Classifications issued without all required information
  - Movement safety evaluated by DIA's Hazardous Material Transportation Office
  - X-rays not normally conducted in overseas location
- ✓ **Exploitation material is stored as if it were U.S. materiel but does not share the controls applied to U.S. materiel**
- ✓ **Some items gathered in quantity during the intelligence process have been released for use. USSOCOM has ended that practice but NGIC does sometimes provide munitions for others**
- ✓ **No process to validate that exploitation samples are safe for transportation, handling and storage**
- ✓ **No source of funds to make safe the exploitation process**
- ✓ **Results of exploitation process kept locally; little information is shared**

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# Non-Standard/Foreign Ammo Work Group



## Principal Test & Evaluation Findings

- ✓ **Test Directors may believe non-standard ammunition issued by the ASP has been assessed as safe and serviceable**
- ✓ **Non-standard ammunition is often not inspected because there is no criteria available**
- ✓ **There are significant quantities of excess materiel being stored with few of the controls applied to U.S. materiel**
- ✓ **There are no standards set to determine when non-standard materiel should be demilitarized**



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# Non-Standard/Foreign Ammo Work Group



## Soldier Training Findings

- ✓ USSOCOM sets their own standards for their Systems Safety
- ✓ Not only non-standard ammunition, but foreign and commercial weapons may pose risks
- ✓ Non-standard ammunition cannot be given the same level of surveillance as U.S. materiel due to lack of technical data and inability to conduct periodic reliability tests
- ✓ Non-standard ammunition does not undergo Army Systems Safety Assessments and Health Hazard Analysis, or have Surface Danger Zones
- ✓ Reporting of malfunctions of non-standard ammunition is not as comprehensive as for U.S.
- ✓ Processes employed at ASPs and depots for release of non-standard ammunition are not as thorough as for U.S.

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# Non-Standard/Foreign Ammo Work Group



## Research Team Results

### ✓ Strengths

- Both Picatinny and Aberdeen have instituted detailed Risk Assessment processes prior to any testing
- USSOCOM has established a cell at Picatinny to coordinate procurements
- ARDEC USSOCOM Cell and the ARDEC System Safety Office, is establishing a safety review process for non-standard ammunition to be used by soldiers
- Accountability at the local level is good but not available at higher levels
- Aberdeen has developed a standardized risk assessment review process
- Bluegrass warehousing of non-standard ammunition is an extensive and well-organized operation
- Picatinny ASP has a rule in place that non-standard ammunition will not be kept over two years unless positively justified by the responsible office
- Redstone has begun to look at its large quantity of excess materiel and validate the need for retention
- USSOCOM has teamed with the U.S. Marine Corps to develop user manuals for foreign weapon systems
- NGIC has developed extensive catalogs of the materiel they have gathered and exploited over the years.

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# Non-Standard/Foreign Ammo Work Group



## Research Team Results

- ✓ Areas for Improvement
  - Use of Non-Standard Munitions necessarily involves heightened risks that cannot be eliminated
  - All must be cautioned against an assumption of safety
  - Three main areas of use, each posing specific concerns
    - Intelligence Exploitation (most hazardous; needs review)
    - Test and Evaluation (risks are addressed but not fully known)
    - Soldier Training (unavoidable risks must be acknowledged)
  - The Army does not have a good inventory of these items in storage and all who are involved with them
  - Good accountability but no standard accounting & cataloging method
  - No lifecycle management; no surveillance; unknown conditions; unknown risks
  - No standards for retention; large excess in storage; demil requirements unknown
  - USSOCOM operations cannot be curtailed



# Non-Standard/Foreign Ammo Work Group



## Conclusions

- ✓ We do not believe it possible to reduce the risk associated with non-standard ammunition to the level we obtain for Safety-Certified U.S. munitions. **It is imperative that users understand and accept the heightened risk**
- ✓ The advent of LMP may provide an opportunity for the Army to address accountability of non-standard materiel
- ✓ Consult the Army Environmental Office on the disposal concerns
- ✓ Workgroup must now consider the issues to be addressed and the means to move forward